WHAT IS CLAIMED IS:

1. A method for starting a gas generation system for generating a hydrogen-containing gas for operating a fuel cell, having devices for converting starting substances into the hydrogen-containing gas, having devices for conditioning at least some of the starting substances, having devices for removing undesirable gas constituents from the hydrogen-containing gas and having a starting burner, characterized in that in a first method step at least one fuel is burnt in the starting burner (11), the hot exhaust gases from the combustion firstly heating the devices (7) for conditioning at least some of the starting substances, and the residual heat which still remains thereafter being used to heat at least one further component (12), the devices for converting the starting substances being heated by electrical heating, after which, in a second method step, the starting substances are added to the respective components of the devices after a starting temperature has been reached, and after which, in a third method step, the quantitative ratios of the starting substances with respect to one another are changed continuously toward the quantitative ratios provided for operation as intended.

2. The method as claimed in claim 1, characterized in that the starting burner (11) used is a porous burner.

3. The method as claimed in claim 1 or 2, characterized in that the starting substances used are water (H_2O), an oxygen-containing medium (O_2) and a hydrocarbon-containing compound (C_nH_m), with the same hydrocarbon-containing compound (C_nH_m) being used as fuel in the starting burner (11).

4. The method as claimed in claim 3, characterized in that the hydrocarbon-containing compound (C_nH_m) which is fed to the devices for converting the starting substances during the second method step is evaporated by means of electrical energy at least during part of the time of the second method step.

5. The method as claimed in claim 3 or 4, characterized in that in the devices for conditioning at least some of the starting substances, the starting substance water (H_2O) is heated and evaporated and at least some of the oxygen-containing medium (O_2) used as starting substance is heated.

6. The method as claimed in one of claims 1 to 5, characterized in that the further component (12) which is heated by the residual heat which remains is a hydrogen separation module (9) based on membranes which are selectively permeable to hydrogen, as a gas purification device.

7. The method as claimed in one of claims 1 to 6, characterized in that the further component (12) heated by the residual heat which remains, via a heat exchanger (14), is a cooling circuit.

8. The method as claimed in claim 7, characterized in that the residual heat is used to heat firstly the hydrogen separation module (9) and then the cooling circuit.

9. The method as claimed in claim 7 or 8, characterized in that the cooling circuit heats the fuel cell (2).

10. The method as claimed in claim 7, 8 or 9, characterized in that the cooling circuit heats a selective oxidation stage (13).

11. The method as claimed in one of claims 1 to 10, characterized in that an autothermal reformer (6) and at least one shift stage (8, 8a, 8b) arranged downstream of the latter are used as devices for converting the starting substances.

12. The method as claimed in claim 11, characterized in that some of the carbon monoxide (CO) and hydrogen (H_2) coming out of the autothermal reformer (6) is burnt, with the addition of the oxygen-containing medium (O_2), for the further heating of the at least one shift stage (8, 8a, 8b) during the second method step.

13. The method as claimed in one of claims 1 to 12, characterized in that the gas which is generated in the devices for converting the starting substances, at least during the initial phase of the second method step, is passed through a bypass (16) around the devices for removing undesirable gas constituents from the hydrogen-containing gas and/or the fuel cell and is fed directly for catalytic combustion (10), which for its part delivers energy for operating the devices for conditioning at least some of the starting substances.